

NOTES ON TEXAS BEES

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Lithurgus.

During the spring of 1928 Mr. Geo. P. Engelhardt, of the Brooklyn Museum, visited this Laboratory. While here he examined the local collection of Hymenoptera and suggested that he take a selection from the group to Dr. Herbert F. Schwarz, of the American Museum of Natural History, for identification. Under the date of Dec. 11, 1928, Dr. Schwarz writes, that among the bees sent is one male of *Lithurgus bruesi* Mitchell, a bee just described by Dr. Theo. B. Mitchell, and as the female is unknown it would be well to collect all of the species seen.

On the advice of Dr. Schwarz, the *Megachile* in the collection here were sent to Dr. Mitchell for determination. In giving the names of the bees sent, he writes on February 5, 1930:

"The most interesting specimen in the lot is the male of *Lithurgus*. It so happens that there was also a single male of this same species in the lot which you sent me previously, and these two are the only specimens other than the type which I have seen. The type was collected at Austin by Professor Brues for whom I named it. This may possibly be the long-tongued Megachilid you mentioned seeing among your specimens, as the tongue of *Lithurgus* is extremely long."

Accompanying Dr. Mitchell's original description of *L. bruesi* M. is this note.

"Type: Male (Type No. 15710, Mus. Com. Zool.); Austin, Texas (C. T. Brues collector)."

According to this information there were on February 5, 1930, the following known specimens of *L. bruesi*:

1. The type.
2. A specimen collected at the Laboratory, but in the collection of Dr. Mitchell.
3. Two specimens, one identified by Schwarz and one by Mitchell in the collection here. The type and the two specimens here bear no date, the one in the Mitchell collection has a date of April 27, 1929. All specimens are males.

This information was the incentive for an intensive, prolonged, but successful search. The local collections of insects as well as

those at the University of Texas and A. & M. College furnished no other specimens. Dr. Mitchell suggested that as *Lithurgus gibbosus* was found on cactus flowers, *L. bruesi* also might be found there. A review of the literature showed that Cresson reported three species, *Lithurgus gibbosus* Sm., *L. compressus* Sm., and *L. apicalis* Cress. from Texas, yet no species of *Lithurgus* is listed in "Hymenoptera Texana," the bulk of whose mentioned species were collected in this part of Texas. It was therefore apparent that there were two species to look for.

The first of the cacti comes into bloom here about March 1st, and a succession of species furnish continued bloom until June 15th. Preparation was made to collect specimens of all insects visiting the cacti blooms during the spring of 1930. The spring was backward. The weather report shows that the temperature was much below normal and the number of cloudy days as well as the number on which rain fell much above normal. Nevertheless, the rainfall was far below normal. All these conditions were adverse to bees and cacti, both of which like hot sunshine and lots of it.

Although many bees were captured *Lithurgus* was not found until May 12th, when *Opuntia lindheimeri*, our most numerous cactus, was at the end of its bloom. The final count of its insect visitors was being made to get the per cent. of *Apis mellifica* L., when late in the afternoon a number of specimens of *Lithurgus* were captured. The next day no *O. lindheimeri* flowers opened, but *Lithurgus* was discovered collecting pollen on *Opuntia ellisiana*, the cultivated spineless cactus. The afternoon of the same day this bee was caught sucking nectar from *Monarda* and *Vitex*. All species of plants in bloom were watched and all-day observations made. No new food plants were found. The last *Lithurgus* was seen on June 4th, the same day *O. ellisiana* dropped its last bloom.

Table 1 gives the list of plants observed, their blooming dates, and number of species of insect visitors.

Table 2 the dates of capture of *Lithurgus* and the numbers of each sex.

Table 3 the dates of blooming and capture of *Lithurgus*.

As soon as a series of *Lithurgus* was collected it was easily seen that there were at least two and perhaps more species or forms

present. A selection sent to Dr. Mitchell confirmed this belief, as *L. gibbosus* composed about half the material and *L. bruesi* the remainder. *L. compressus* was thought to be present and was, as Dr. Mitchell writes that this is a synonym for the male of *gibbosus*. Thus in this intensive search two species, one not taken before, at this Laboratory, and the unknown female of *bruesi* have been found.

The general appearance of the two species is so close that it is impossible to tell them apart on the flowers. The female on alighting in a cactus flower rests on the stamens for an interval then pushes her head against the pistil column and goes down to the nectary at the base. While in this position the legs and plates of the abdomen are worked combing out the pollen. While thus occupied the bees are easily captured by placing the killing bottle over the flower. In the series secured this spring the net was never used on cactus flowers. The male will alight on the cactus flowers, go around the pistil looking for a female, and if none is present will clasp the pistil column, head up and remain motionless for several minutes. They too are most easily taken by placing the bottle over them. The pollen of cactus is mostly gone by noon and the flowers close early. None or very few *Lithurgus* were taken on cactus after 12:00 noon.

In the afternoon both males and females collected nectar on *Monarda* and *Vitex*. On these plants they were very wild and hard to catch. From the large amount of pollen collected, nests must have occurred in the vicinity but a detailed search failed to find them. These bees fly very rapidly and could not be "coursed" like honey bees.

Owing to the fact that seven years of collecting here produced only four males of this genus and that no specimens could be found in nearby Texas collections, and that this year, in three weeks' time, one hundred and twenty-nine specimens representing two species including the undescribed female of *L. bruesi* Mitchell were taken, leads to the conclusion, supported by other evidence, that certain insects are governed in their life activities by peculiar optimum weather conditions, so that when this condition exists they are present. When the condition does not exist they continue in the pupal stage until the reoccurrence of this condition, be it one or many years.

TABLE I.

LIST OF PLANTS OBSERVED, BLOOMING DATES AND INSECT VISITORS.

Plant	In Bloom— Out of Bloom	No. Species of Insect Visitors
<i>Mamillaria heyderi</i> Muhleuff ..	March 25–April 10	5
<i>Echinocactus texensis</i> Hoepf. ...	April 10–April 17	6
<i>Echinocactus caespitosus</i> Engl. and Gray	April 10–April 16	2
<i>Opuntia macrorhiza</i> Engelm. ...	April 25–May 10	8
<i>Opuntia lindheimeri</i> Engelm. ...	April 15–May 12	8 including Lithurgus
<i>Opuntia leptocaulis</i> D. C.	May 14–June 15	5
<i>Opuntia ellisiana</i> Griff.	May 13–June 4	7 including Lithurgus
<i>Echinocactus setispinus</i> Engelm.	June 1–June 4	4 “ “
<i>Monarda punctata</i> L.	April 16–May 23	10 “ “
<i>Monarda citriodora</i> Cerv.	April 16–May 23	10 “ “
<i>Vitex negundo incisa</i>	April 20–June 5	18 “ “

TABLE II.

DISTRIBUTION, PERCENT OF SEX, AND WEATHER RELATION.

<i>Lithurgus gibbosus</i> Sm.			<i>Lithurgus bruesi</i> Mitchell				Weather
Date	♀	♂	♀	♂	Total		
May 12.....	I	7	2	3	13	Cloudy	
13.....	2	2	I		5	Cloudy	
14.....	2	5	2		9	Cloudy	
15.....	6	5	I	I	13	Part Cloudy	
16.....	I		4		5	Cloudy	
17.....						Cloudy, Rain	
18.....						Part Cloudy, Rain	
19.....	I	4	3		8	Clear	
20.....	4		9		13	Clear	
21.....						Part Cloudy	
22.....	5	I	12	2	20	Clear	
23.....	2				2	Part Cloudy	
24.....	2		I		3	Part Cloudy	
25.....	I				I	Clear	
26.....	II	I	I		13	Clear	
27.....	6		4		10	Part Cloudy	
28.....						Rain, Cloudy	
29.....	I		I		2	Cloudy	
30.....	2				2	Part Cloudy	
31.....	4		3		7	Cloudy	
June 1.....	I	I			2	Clear	
2.....						Part Cloudy	
3.....						Clear	
4.....	I				I	Part Cloudy	
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TABLE III

	May										June													
	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4
Total	13	5	9	13	5	8	13	8	13	20	2	2	3	1	13	10	2	2	7	2	2	2	3	4
<i>Opuntia lindheimeri</i> Engelm. No. Lithurgus ...	13	5	9	13	5	8	13	8	13	20	2	2	3	1	13	10	2	2	7	2	2	2	3	4
<i>Opuntia elisiana</i> Griff. No. Lithurgus ...	3	5	5	3	3	4	13	4	13	20	2	2	3	1	13	10	2	2	7	2	2	2	3	4
* <i>Opuntia leptocaulis</i> D. C. No. Lithurgus ...																								
<i>Monarda punctata</i> L. No. Lithurgus ...	1	2	3																					
<i>Monarda citriodora</i> Cerv. No. Lithurgus ...	1	3	1	2																				
<i>Vitex negundo incisa</i> No. Lithurgus ...	1	1	2	1																				

* *Opuntia leptocaulis* D. C. is carried in this table because it was in bloom during the flight of *Lithurgus*, but no specimens were seen on this plant.